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Characteristics and outcomes of ICU patients with sepsis transmitted by cats and dogs: the PETSEPSIS multicentre retrospective observational cohort study

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Abstract

Background Millions of households have cats or dogs as pets, and infections due to bites or scratches are increasing, with the most common pathogens being *Pasteurella* spp., *Bartonella* spp., *Capnocytophaga* spp, and *Francisella tularensis*. The objective of this study was to describe patients admitted to the intensive care unit (ICU) for infection transmitted by cats or dogs, as well as their outcomes.

Methods The retrospective multicentre observational cohort study PETSEPSIS included consecutive adults admitted to 46 ICUs in France between 2009 and 2019 for sepsis due to cat or dog bites and/or caused by any of the four above-listed bacteria. We described their features and outcomes and performed univariate and multivariate analyses to identify factors associated with death.

Results We included 174 patients with a median age of 64 [50–74] years; 58.1% were male. The median SAPS II score was 42 [28–58]. Mechanical ventilation was required in 51.2% of patients, for a median duration of 7 [4–13] days. Vasopressor support was used in 53.5%, renal replacement therapy in 19%, and limb amputation in 3.6% of the patients. The median ICU length of stay was 7 [4–16] days. Hospital mortality was 24.1%. The clinical presentation and severity of sepsis were similar across bacteria, although patients with *Pasteurella* spp. were older and had more

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comorbidities. Contact with cats were more often reported for *Pasteurella* spp. and *Bartonella* spp. infections and contact with dogs for *Capnocytophaga* spp. infections. Risk factors for hospital mortality present on ICU admission were older age, smoking, preexisting liver disease, high serum creatinine, and anaemia. Neither the type of microorganism nor the initial antimicrobial treatment was associated with mortality.

Conclusions This large multicentre study shows that infections transmitted by cats and dogs are infrequent reasons for ICU admission but are associated with substantial morbidity and mortality. Mortality was associated with older age and comorbidities but not with the type of microorganism or initial antibiotic treatment.

Keywords Bites, Scratches, Dogs, Cats, *Capnocytophaga* spp., *Pasteurella* spp., *Bartonella* spp., *Francisella tularensis*, Sepsis, Critical illness

Introduction

Cats and dogs are popular pets found in millions of households. In 2021, there were 15.1 million cats and 7.5 million dogs in France [1]. Bites, scratches, and licking by cats and dogs can cause infections in humans via inoculation of the microorganisms present in the oral cavity or claws of these animals [2–4]. Dog bites lead to millions of emergency department visits in France [5]. In most cases, prompt wound irrigation and debridement, with early prophylactic antibiotic therapy either routinely or when deemed necessary, are successful in preventing infections. Nonetheless, sepsis requiring intensive-care-unit (ICU) admission can develop [2].

The bacteria most often transmitted by cats and dogs are *Capnocytophaga canimorsus*, *Capnocytophaga cynodegmi*, *Pasteurella multocida*, and *Bartonella henselae*. In one study, of 65 patients with *Capnocytophaga canimorsus* bacteraemia, 25% required ICU admission; of note, although all patients had contact with dogs, only 37% had been bitten [6]. The few studies of septic shock caused by *Pasteurella* spp. are heterogeneous, and two of them date back several decades [7–9]. ICU admission for bartonellosis seems rare and chiefly associated with complicated endocarditis [10]. Other bacteria, such as *Francisella tularensis*, associated chiefly with rabbits and rodents, can cause infections after cat or dog bites [11, 12]. Of note, *Streptococcus* spp., *Staphylococcus* spp., *Neisseria* spp., *Morexella* spp., *Fusobacterium* spp., *Bacteroides* spp., and *Prevotella* spp. can be found in cats and dogs but are also present in the environment [13]. To date, no large study has specifically addressed ICU admissions for infections transmitted by cats or dogs. Thus, data on the topic are scarce.

The PETSEPSIS multicentre retrospective observational cohort study reported here focused on infections associated with cats and dogs of sufficient severity to require ICU admission. The study objective was to document the characteristics, clinical symptoms, and predictors of mortality in this population.

Methods

Study design and population

The PETSEPSIS multicentre retrospective observational cohort study included consecutive adults (≥ 18 years of age) admitted to any of 46 ICUs in France between January 2009 and December 2019 for infection transmitted by, or highly suspected to be transmitted by, cats or dogs. We identified these patients by searching the hospital databases for the following International Classification of Diseases-10th revision codes among patients admitted to the ICU: W54 (bitten by a dog), W55 (bitten by a cat), A28.0 (pasteurellosis), A44.0 (bartonellosis), A21.0 (tularaemia); as well as by screening the bacteriological laboratory databases of each participating centre for samples containing the pathogens specific of cats and dogs. In patients without codes for cat or dog bites but with infections caused by *Pasteurella* spp., *Bartonella* spp., *Francisella tularensis*, or *Capnocytophaga* spp, transmission by a cat or dog was considered highly likely, warranting study inclusion.

The ethics committee of the French Intensive Care Society approved the study (#CE SRLF20-08) on 12/02/2020 and waived the requirement for informed consent, in compliance with French law on retrospective studies of anonymized data.

Data collection

Data collected within the first 24 h after ICU admission included age, sex, body mass index, chronic comorbidities (e.g., cancer, immunodeficiency, splenectomy, diabetes mellitus, liver disease, heart failure, respiratory failure, chronic obstructive pulmonary disease, and chronic kidney disease), alcohol and tobacco use, identified pathogens and their antibiotic sensitivities, type of sample (e.g., blood cultures, synovial fluid, tracheal aspirate, and/or wound swab), exposure to cats and dogs, and behaviours or injuries related to the exposure, Simplified Acute Physiology Score (SAPS II), main reason for ICU admission (e.g., sepsis; acute circulatory, respiratory, or central nervous failure; acute hepatic dysfunction; acute kidney injury; other), clinical manifestations on admission (i.e., debilitation, fever, myalgia, arthralgia, headache, altered

consciousness, meningeal syndrome, jaundice, vomiting, diarrhoea, abdominal pain, dyspnoea, cough, bleeding), clinical parameters (i.e., arterial blood pressure, body temperature, respiratory rate, heart rate, and urinary output), Glasgow Coma Scale score, and routine laboratory parameters.

From ICU admission to discharge, we recorded the following: complications (i.e., acute respiratory distress syndrome, dermo-epidermitis, necrotizing cellulitis, amputation, arthritis, osteitis, pneumonia, endocarditis, ascitic fluid infection, meningitis, meningoencephalitis, septic cardiomyopathy, and disseminated intravascular coagulation), antibiotic treatments, and life-sustaining therapies (i.e., invasive mechanical ventilation, non-invasive mechanical ventilation, vasoactive drugs, sedation, renal replacement therapy, extracorporeal membrane oxygenation). We also recorded surgical procedures performed to treat the infection.

Statistical analysis

Continuous variables were described as median [interquartile range] and categorical variables as number (%). All tests were two-sided, and p values < 0.05 were considered significant. Patient symptoms and baseline laboratory data were discretized using standard cut-offs (Table 1). Risk factors for in-hospital mortality were identified using a logistic regression model. Univariate analyses were performed and all variables associated with p values < 0.20 were considered for entry into a multivariate model. The final model was built using stepwise selection. The odds ratios (ORs) were computed with their 95% confidence intervals (95%CIs).

Analyses were performed using SAS software version 9.4 (SAS Institute, Cary, NC).

Results

The 46 participating ICUs were distributed throughout mainland France and overseas French territories. Over the 10-year study period, 174 patients were admitted to the participating ICUs for infection transmitted, or highly suspected to be transmitted, by cats or dogs.

Patient characteristics

Table 1 reports the main baseline features of the 174 study patients. The Median age was 64 years [50–74]. The majority of the patients were male (58.1%) and the median SAPS II score was 42 [28–58]. 109 (62.6%) patients had preexisting diseases. The most common acute illnesses on ICU admission were sepsis, respiratory failure, and circulatory failure. A recent bite or licking by a cat and/or dog was reported by 90 (51.7%) patients. On ICU admission, the most common clinical symptoms were fever, debilitation, dyspnoea, and confusion.

Bacteriological data

The bacteria and sites of recovery are reported on Fig. 1; Table 2, respectively. *Pasteurella* spp. predominated by far and *Capnocytophaga* spp. was the second most common micro-organism. Other commensal bacteria from animal oral flora such as *Staphylococci* and *Streptococci* were identified in only five patients. In 12 (6.9%) patients, no bacterial micro-organism was identified. The clinical presentation and outcomes according to the bacterial micro-organism involved are shown in eTable 1 (Supplementary Appendix). Patients infected with *Pasteurella spp*. were older, had a heavier comorbidity burden, and more often had acute respiratory distress syndrome. Pasteurellosis was usually diagnosed by blood cultures (50%) or respiratory samples (40%). *Capnocytophaga* spp. was primarily found in blood cultures (71.4%), followed by cerebrospinal fluid (21.4%) and respiratory samples (17.8%). Of note, amputation was more common in infections by *Capnocytophaga* spp. than by other bacteria. Contact with cats predominated in patients with *Pasteurella* spp. and *Bartonella* spp. infections and contact with dogs in *Capnocytophaga* spp.

Outcomes

Table 3 reports the main complications and life-support treatments. During the ICU stay, 51.2% of patients required mechanical ventilation, for a median duration of 7 [4–13] days; 53.5% received vasoactive drugs; and 19.0% required renal replacement therapy. Limb amputation was performed in 6 patients (3.6%), including 3 with *Capnocytophaga spp.*, 2 with *Pasteurella spp.*, and 1 with polymicrobial infection Median lengths of stay were 7 [4–16] days in the ICU and 18 [9–38] days in the hospital.

Of the 174 patients, 32 (18.39%) died in the ICU and 42 (24.14%) in the hospital (i.e., 10 patients died in the hospital after ICU discharge). Factors associated with hospital mortality by univariate analysis were older age; chronic alcohol abuse; chronic liver failure; bacteraemia; ascites infection; lower values for haemoglobin, platelets, and prothrombin time; and higher values for bilirubin, creatinine, and lactate (Table 4). By multivariate analysis, factors on admission that were independently associated with hospital mortality were older age (OR, 1.1; 95%CI, 1.0–1.1; $p = 0.002$), smoking (OR, 3.0; 95%CI, 1.1–8.0; $p = 0.027$), chronic hepatic dysfunction (OR, 3.9; 95%CI, 1.5–10.1; $p = 0.005$), higher creatinine level (OR, 1.0; 95%CI, 1.0–1.0; $P = 0.002$), and lower haemoglobin level (OR, 0.8; 95%CI, 0.7–0.95; $P = 0.011$). Neither the type of bacterial micro-organism nor the initial antimicrobial therapy was associated with mortality.

Table 1 Main features on ICU admission in the 174 patients included in the PETSEPSIS study

	Median [IQR] or *n* (%)
Age[a], years	64 [50–74]
Males[a]	101 (58.1)
Weight[a], kg	75 [65–90]
BMI[a], kg/m^2	26.8 [23.1–32.0]
SAPS II[b]	42 [28–58]
Smoking	51 (30.5)
Chronic alcohol abuse	61 (35.3)
Comorbidities	
At least one comorbidity	109 (62.6)
Chronic liver failure	39 (22.4)
Cancer or immunodeficiency	30 (17.3)
Diabetes mellitus	30 (17.3)
Chronic respiratory failure	25 (14.4)
Chronic renal failure	24 (13.9)
NYHA Class IV heart failure	7 (4.1)
Splenectomy	6 (3.5)
Acute illness on ICU admission	
Sepsis	86 (49.4)
Acute respiratory failure	55 (31.6)
Acute kidney injury[c]	54 (31.0)
Circulatory failure	32 (18.4)
Acute central nervous failure	25 (14.4)
Multi-organ failure	23 (13.2)
Acute liver dysfunction	6 (3.5)
Risk factors for contamination	
No bite, scratch or licking reported	84 (48.3)
Bites or licking by dogs	42 (24.1)
Bites, scratch or licking by cats	40 (23)
Bites, scratch or licking by cats and dogs	8 (4.6)
Clinical symptoms on ICU admission	
Fever	104 (59.8)
Dyspnoea	86 (49.4)
Debilitation	58 (33.3)
Confusion	39 (22.4)
Abdominal pain	22 (12.6)
Arthritis	20 (11.5)
Cough	20 (11.5)
Vomiting	18 (10.3)
Diarrhoea	16 (9.2)
Headache	15 (8.6)
Myalgia	12 (6.9)
Jaundice	10 (5.8)
Bleeding	6 (3.5)
Initial antibiotic effective on recovered pathogen[d]	
Yes	147 (84.5)
No	12 (6.9)
Unknown	15 (8.6)
Laboratory data on ICU admission (worst value within 24 h)	
Haemoglobin (g/dL)	11.4 [9.5–13.1]
Leucocytes (G/L)	11.6 [6.3–16.8]
Platelets (G/L)	122 [54.5–223.5]
Prothrombin rate (%)	
Total blood bilirubin (µmol/L)	16 [9–43]

Table 1 (continued)

	Median [IQR] or *n* (%)
Blood aspartate aminotransferase (IU/L)	61 [25–152]
Blood alanine aminotransferase (IU/L)	36 [17–69]
Serum creatinine (µmol/L)	119 [76–217]
Glucose (mmol/L)	6.9 [5.5–8.7]
Lactate (mmol/L)	2.1 [1.4–4.1]

BMI: Body mass index; SAPS II: Simplified Acute Physiology Score version II; NYHA: New York Heart Association

[a]Recorded on ICU admission

[b]The SAPS II was determined 24 h after ICU admission. SAPS II values can range from 0 (lowest level of critical illness) to 163 (most severe level of critical illness with 100% predicted mortality). A score of 50 predicts a 46.1% risk of death

[c]Acute kidney injury was defined as a SOFA renal subscore ≥ 2, corresponding to a blood creatinine level > 170 µmol/L

[d]First antibiotic treatment initiated in the hospital, compared with the usual sensitivity profile of recovered bacteria organism

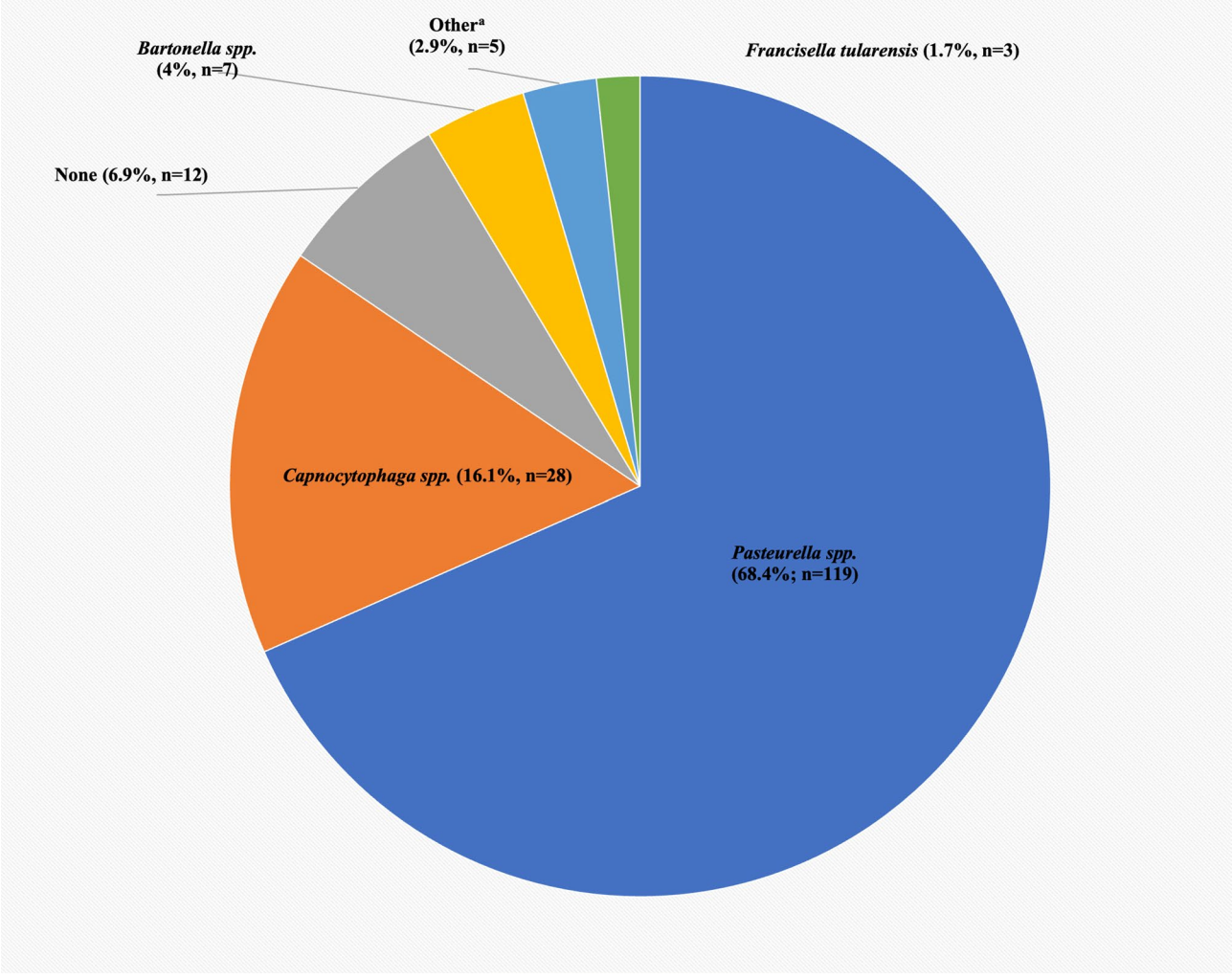

Fig. 1 Bacteriological data of the 174 patients included in the PETSEPSIS study. Spp, species. [a]*Aeromonas Veronii* (*n* = 1); *Staphylococcus* spp. (*n* = 1); *Streptococcus* spp. (*n* = 1); *Escherichia coli* and *Aeromonas hydrophila* (*n* = 1)

Discussion

In this multicentre retrospective observational study done over a ten-year period in France, only 174 patients were admitted to the 46 participating ICUs, indicating that critical illness due to infections transmitted by cats and dogs is uncommon. However, substantial morbidity and mortality was documented, with nearly a quarter of patients dying before hospital discharge. Older age, smoking, and chronic liver disease were the strongest independent risk factors for death. *Pasteurella* spp. was

Table 2 Sampling sites for bacteria identified in the PETSEPSIS study

	N **(%)**
Sampling site	
Blood	83 (48.5)
Pulmonary	51 (29.8)
Deep sample (biopsy, abscess, operating room)	23 (13.5)
Wound or purulent skin discharge (swab)	12 (7.0)
Cerebrospinal fluid	7 (4.1)
Ascitis	6 (3.5)
Urinary	3 (1.8)
Other[a]	11 (6.4)

[a] Synovial fluid puncture ($n=3$); Bartonella serology ($n=4$); Vaginal swab ($n=1$); Pleural fluid ($n=1$); Not specified ($n=2$)

Table 3 Outcomes of the 174 patients included in the PETSEPSIS study

Complications	**Median [IQR] or *n* (%)**
Acute kidney failure	80 (46.5)
Tissue infection	58 (33.7)
Pneumonia	58 (33.3)
ARDS	25 (14.4)
Septic cardiomyopathy	19 (11.0)
Septic arthritis	18 (10.4)
Disseminated intravascular coagulation	18 (10.3)
Distal necrosis	14 (8.5)
Osteitis	13 (7.5)
Endocarditis	13 (7.5)
Meningitis/Encephalitis	10 (5.8)
Spontaneous bacterial peritonitis	9 (5.2)
Life support and outcomes	
Vasoactive drug	92 (53.5)
Invasive ventilation	89 (51.2)
Non-invasive ventilation	36 (20.7)
Renal replacement therapy	33 (19.0)
ECMO	2 (1.2)
Surgery	40 (23.0)
Amputation	6 (3.6)
Duration of renal replacement therapy, days	8 [3–17]
Duration of invasive mechanical ventilation, days	7 [4–13]
ICU stay length, days	7 [4–16]
Hospital stay length, days	18 [9–38]
ICU mortality	32 (18.4)
Hospital mortality	42 (24.1)

ARDS: Acute respiratory distress syndrome; ECMO: Extracorporeal membrane oxygenation; ICU: Intensive care unit

the most commonly identified pathogen by far, followed by *Capnocytophaga* spp. Among patients infected by *Capnocytophaga* spp., one in ten required amputation.

The high ICU and hospital mortality rates of 18.4% and 24.1%, respectively, and considerable life-support requirements highlight the severity of infections that are transmitted by cats and dogs and require ICU admission. The long ICU and hospital stays further underline the severity, with a heavy burden on healthcare systems. Compared to overall ICU populations with sepsis assessed in a vast international study, our patients had more comorbidities, notably chronic liver disease, immunodeficiency or cancer, and diabetes [14]. Factors present on ICU admission and independently associated with hospital mortality were older age, smoking history, chronic liver disease, renal dysfunction, and anaemia. These findings are in line with prior studies suggesting that host vulnerability may play a major role in outcomes of severe zoonotic infections [15]. Interestingly, neither the specific type of bacterial organism identified nor the initial antimicrobial therapy administered was independently associated with hospital mortality by multivariate analysis. Also, hospital mortality was not significantly different according to whether a bite or licking was reported. Thus, patient-related factors rather than the microbiological aetiology or initial antimicrobial therapy seem to govern the prognosis. Limb amputation was performed in 3.6% of patients overall and in 10.7% of those with *Capnocytophagosis* spp. infection. In studies of patients with sepsis due to any cause, fewer than 1% of patients required amputation, including in the subset that required vasopressor therapy [16, 17]. Of note, the proportion of patients with purpura fulminans due to *Neisseria meningitidis* or *Streptococcus pneumoniae* infection was far higher, at 28.3%, in a French cohort study published in 2018 [18].

The predominance of *Pasteurella* spp. is consistent with previous data on bites and scratches by cats and dogs [2]. While non-severe disease due to *Pasteurella* spp. or *Capnocytophaga* spp. typically presents as soft tissue infection or arthritis, our patients often had respiratory failure or sepsis with neurological symptoms. Absence of bites and a predominant role for patient vulnerability has been reported in patients with severe pasteurellosis [19]. *Capnocytophaga* spp. infections were less common than pasteurellosis; affected relatively healthier patients; and manifested as neurological, gastro-intestinal, and coagulation impairments and as limb necrosis, with a higher amputation rate than with the other pathogens in our study [20, 21]. In patients with *Capnocytophaga* spp. sepsis, mortality was lower than previously reported and more closely linked to sepsis severity [22–24]. Bartonellosis was uncommon and chiefly responsible for endocarditis. None of our patients had other, previously reported presentations of bartonellosis such as hepatosplenic peliosis, bacillary angiomatosis, or trench fever, suggesting a low incidence and/or mild presentation of these conditions [25, 26]. Only three of our patients had tularaemia, of which severe cases seem rare in France and in other countries [27]. In Finland, seasonal outbreaks occur, but

Table 4 Univariate analysis to identify risk factors on admission for hospital mortality in patients included in the PETSEPSIS study

	Died	Survived	OR [95%CI]	*p* value
	N **= 42**	***N*** **= 132**		
Age, y, median [IQR]	67.0 [62.0–75.0]	63.0 [48.5–72.5]	1.0 [1.0 – 1.1]	0.01
Males, n (%)	21 (50.0)	80 (60.6)	0.7 [0.3 – 1.3]	0.23
BMI, k/m^2, median [IQR]	27.3 [24.8–31.6]	26.6 [22.6–32.3]	1.0 [0.9 – 1.1]	0.73
Smoking, n (%)	16 (41.0)	35 (27.3)	1.9 [0.9 – 3.9]	0.11
Chronic alcohol abuse, n (%)	22 (52.4)	39 (29.8)	2.6 [1.3 – 5.3]	0.01
Comorbidities, n (%)				
Chronic liver failure	20 (47.6)	19 (14.4)	5.4 [2.5 – 11.8]	< 0.0001
Cancer or immunodeficiency	9 (21.4)	21 (16.0)	1.4 [0.6 – 3.4]	0.42
Chronic respiratory failure	8 (19.1)	17 (12.9)	1.6 [0.6 – 4.0]	0.32
Chronic renal failure	7 (17.1)	17 (12.9)	1.4 [0.5 – 3.6]	0.50
Diabetes mellitus	4 (9.8)	26 (19.7)	0.4 [0.1 – 1.4]	0.15
NYHA Class IV heart failure	3 (7.1)	4 (3.1)	2.4 [0.5 – 11.4]	0.26
Splenectomy	1 (2.4)	5 (3.8)	0.6 [0.1 – 5.5]	0.67
Bacteria, n (%)				
None identified	1 (2.4)	11 (8.3)	1 (reference)	0.16
Pasteurella spp.	35 (83.3)	84 (63.6)	4.6 [0.6 – 36.9]	
Capnocytophaga spp.	3 (7.1)	25 (18.9)	1.3 [0.1 – 14.1]	
Francisella tularensis	2 (4.8)	1 (0.8)	22.0 [0.9–515.9]	
Bartonella spp.	1 (2.4)	6 (4.6)	1.8 [0.1 – 34.9]	
Other	0 (0.0)	5 (3.8)	-	
Infection site				
Bacteraemia	28 (66.7)	55 (42.6)	2.7 [1.3 – 5.6]	0.008
Pulmonary	10 (23.8)	41 (31.8)	0.7 [0.3 – 1.5]	0.33
Ascites	4 (9.5)	2 (1.6)	6.7 [1.2 – 37.9]	0.03
Cerebrospinal fluid	0 (0.0)	7 (5.4)	0.3 [0–1.6]	0.13
Risk factors for contamination, n (%)				
Bite or lick by cats	9 (21.4)	31 (23.5)	1 (reference)	0.28
Bite or lick by dogs	6 (14.3)	36 (27.3)	0.6 [0.2–1.8]	
Bite or lick by cats and dogs	3 (7.1)	5 (3.8)	2.1 [0.4–10.4]	
No bite or lick	24 (57.1)	60 (45.5)	1.4 [0.6–3.3]	
Initial antibiotic effective on recovered organism, n (%)				
Yes	38 (90.5)	109 (82.6)	1 (reference)	
No	3 (7.1)	9 (6.8)	1.0 [0.3 – 3.7]	0.32
Unknown	1 (2.4)	14 (10.6)	0.2 [0.0 – 1.6]	
Laboratory data on ICU admission, median [IQR]				
Haemoglobin (g/dL)	9.7 [8.5–11.7]	11.7 [10.2–13.3]	0.8 [0.7 – 0.9]	0.006
Leucocytes (G/L)	9.0 [3.5–15.9]	12.4 [7.5–17.2]	1.0 [0.9 – 1.0]	0.23
Platelets (G/L)	75.5 [41.0–153.5]	150.0 [77.5–240.0]	1.0 [1.0 – 1.0]	0.002
Prothrombin rate (%)	37.0 [23.0–53.0]	64.0[47.0–80.0]	1.0 [0.9 – 1.0]	< 0.001
Total blood bilirubin (µmol/L)	41.0 [13.8 – 69.0]	13.5 [8.0 – 26.0]	1.0 [1.0 – 1.0]	0.01
Blood aspartate aminotransferase (IU/L)	112.5 [54.0 – 365.0]	49.0 [22.0 – 126.0]	1.0 [1.0 – 1.0]	0.09
Blood alanine aminotransferase (IU/L)	40.5 [19.0 – 153.5]	34.0 [17.0 – 61.0]	1.0 [1.0 – 1.0]	0.34
Serum creatinine (µmol/L)	206.5 [126.0–275.0]	98.5 [70.0–169.0]	1.0 [1.0 – 1.01]	0.003
Glucose (mmol/L)	6.0 [4.6–7.6]	7.0 [5.8–8.9]	0.9 [0.8 – 1.1]	0.18
Lactate (mmol/L)	4.0 [1.6–7.8]	1.8 [1.2–2.8]	1.4 [1.2 – 1.6]	< 0.001

OR: Odds ratio; 95%CI: 95% confidence interval; ICU: Intensive care unit

the disease seems rarely severe with only 3% of patients requiring ICU admission in one study and 100% survival [28]. Of the three patients with tularaemia in our cohort, two died.

The main limitation of our study is the retrospective design, which was required by the low incidence of ICU admissions for infections transmitted by dogs and cats. Our cohort is, to our knowledge, the largest to date on severe infections transmitted by cats and dogs. The

retrospective design may have caused information bias. Moreover, the use of codes and microbiological findings to identify eligible patients may have led to selection bias. Second, the diagnostic and therapeutic strategies were not standardized across the 46 participating centres, and variability in patient management may have occurred. However, a large number of participating ICUs was required to obtain a sufficiently large cohort. Our data are consistent with previous reports, supporting the reliability and generalizability of our findings.

Conclusion

Infections transmitted by cats and dogs are uncommon reasons for ICU admission but cause substantial morbidity and mortality. Awareness of the risk factors for mortality, notably older age and chronic liver disease or renal dysfunction, is essential. Early recognition and aggressive management of sepsis in vulnerable patients with recent animal exposure is needed to improve patient outcomes. Prospective studies are warranted to define optimal prevention and treatment strategies in this population.

Abbreviations

95%CI	95% confidence interval
BMI	Body mass index
ECMO	Extracorporeal membrane oxygenation
ICU	Intensive care unit
IQR	Interquartile range
NYHA	New York Heart Association
OR	Odds ratio
SAS	Statistical Analysis System
SAPS II	Simplified Acute Physiology Score version II
spp	Species

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s13054-025-05558-6.

Supplementary Material 1

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Author contributions

JQ, and JR designed the study. JQ supervised the data collection and wrote the first draft of the manuscript. ALT performed the statistical analyses. All authors contributed to collect the data, interpret the results, and revise the manuscript for important intellectual content. All authors approved the final version of the manuscript to be submitted. JR had full access to the data and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

The study protocol was approved by the ethics committee of the French Intensive Care Society (#CE SRLF20-08). Informed consent was not required, according the French law on retrospective studies of anonymized healthcare data.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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